

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND  
INTERFERENCES

In re Application of:	§	Group Art Unit:	2629
Vincent P. Marzen et al.	§	Examiner:	Kevin M. Nguyen
Application No: 10/664,214	§	Attorney Docket:	02CR305/KE
Filed: September 17, 2003	§		
For: METHOD AND APPARATUS	§		
FOR DATA ENTRY FOR A	§		
LIQUID CRYSTAL DISPLAY	§		

Commissioner for Patents  
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**APPLICANTS' BRIEF ON APPEAL TO THE BOARD**

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**APPLICANTS' BRIEF ON APPEAL TO THE BOARD**

This is an appeal from the final rejection of the Examiner dated July 17, 2008, rejecting all claims pending in the case. This Brief is accompanied by the requisite fee set forth in §41.20(b)(2).

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**REAL PARTY IN INTEREST**

The real party in interest in this appeal is the assignee, Rockwell Collins.

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**RELATED APPEALS AND INTERFERENCES**

The application on appeal is not subject to, or an element in, any other appeal or interference proceeding within the U.S. Patent and Trademark Office.

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**STATUS OF CLAIMS**

Claims 1- 20 are pending, have been twice rejected, and are on appeal.

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**STATUS OF AMENDMENTS**

No amendments to the claims or the specification have been filed subsequent to the rejection dated July 17, 2008.

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**SUMMARY OF THE CLAIMED SUBJECT MATTER**

Without limiting the claims on appeal, the independent claims of the invention are summarized below:

Claim 1: A touch screen display apparatus comprising:

a liquid crystal panel 100 having a viewing area 102 with a periphery 104; (See Fig. 1, lines 1-11 page 6 of the specification as filed)

a plurality of shockwave detectors, (106, 107 and 108) disposed about said periphery; and (See Fig. 1, lines 14-16 page 6 of the specification as filed)

said plurality of shockwave detectors (1061, 1071, and 1081) configured to use a time of arrival of a tap-generated shockwave to determine a point of origin of the tap-generated shockwave in the liquid crystal panel which results from a touch occurring at said point of origin. (See Fig. 1 page 7 lines 6-8 of the specification as filed)

Claim 11. A method of detecting a touch on a viewing panel of a liquid crystal display, comprising the steps of:

providing a display panel 100 comprising a liquid crystal material, said display having a viewing area 102; (See Fig. 1 lines 1-11 page 6 of the specification as filed)

tapping a first location on said viewing area and thereby generating a shockwave as a result of such tapping; (See Fig. 1 and lines 1-5 on page 7)



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providing a plurality of shockwave detectors 106, 107 and 108 which are not located at a single location; (See Fig. 1 lines 14-16 page 6 of the specification as filed)

detecting an arrival of said shockwave at each of said plurality of shockwave detectors; (see page 7 lines 6-end)

determining a time of arrival of said shockwave at each of said plurality of shockwave detectors; and, (see page 7 lines 6-end)

locating said first location in response to said step of determining a time of arrival of said shockwave. (See page 7 lines 6-end, page 10 lines 1-end)

Claim 17. An apparatus for detecting a tactile stimuli upon a viewing area 102 of a liquid crystal display 100 comprising:

a liquid crystal material having a viewing surface 102; (See Fig. 1, lines 1-11 page 6 of the specification as filed)

a plurality of shockwave detectors 106, 107 and 108 disposed about a periphery of said viewing surface; (See Fig. 1, lines 14-16 page 6 of the specification as filed) and

means for performing a triangulation computation to determine a location of a point of tactile stimulation 110 on said viewing surface, said means for performing being responsive to signals representative of a detection of a tap-generated shockwave, generated at said point of tactile stimulation, by said plurality of detectors. (See page 7 lines 6-end, page 10 lines 1-end)

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**GROUND OF REJECTIONS TO BE REVIEWED ON APPEAL**

1. Whether claims 1-5 and 11-17 have been properly rejected under 35 U.S.C. §103 (a) as being unpatentable over Eichen et al. in view of Duwaer.

2. Whether claims 6-10 have been properly rejected under 35 U.S.C. §103 (a) as being unpatentable over Eichen et al. in view of Duwaer, further in view of Umenoto.

3. Whether claims 18-20 have been properly rejected under 35 U.S.C. §103 (a) as being unpatentable over Eichen et al. in view of Duwaer, further in view of Wilson.

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**ARGUMENT**

**1. Whether claims 1-5, and 11-17 have been properly rejected under 35 U.S.C. §103 (a) as being unpatentable over Eichen et al. in view of Duwaer.**

The panel is thanked in advance for taking the time to carefully consider the rejection of the Applicants' claims, which is something that Examiner Nguyen appears to be unwilling to do, even after seven office actions.

This is the third appeal in this application. The two prior appeals each included requests for pre-appeal brief review, which we will call PABR1 and PABR2, both of which resulted in reopening of prosecution.

Examiner Nguyen is up to the same old, but now truly exasperating, tricks. The Examiner declares an item in the reference to teach a liquid crystal panel with a periphery, but when he discusses the sensors, these sensors are around another completely different periphery.

He did the EXACT same thing on EXACTLY the same claim limitation in his previous office action -- just using a different reference. As we pointed out in PABR2, the Examiner cites a liquid crystal panel and then cites a plurality of detectors around A DIFFERENT PERIPHERY. How many times can he be allowed to reopen prosecution?

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**Claims 1-5**

On page two of the office action, the Examiner starts the rejection of claim 1 with the follow incorrect statement:

As to claim 1, Eichen teaches a touch screen display apparatus, comprising:  
a display device having a viewing area with a periphery; (see col. 3, line 51, a tablet 21, a border region, fig. 1, col. 4, lines 35-37.)

Please remain mindful that the claims call for “a liquid crystal panel having a viewing area with a periphery.” The Examiner cites col. 3 line 51 of Eichen shown below:

vention is concerned. The peripheral equipment may include a plotter 13, i.e., an XY writer that provides 50 graphic display in response to a data stream supplied to it defining XY coordinates for a pen or the like. The computer system includes, of course, the conventional

Here he says the plotter 13, in Eichen, is a display device and the periphery included in claim 1 is the border area of another device, which is tablet 21. The Examiner appears to think of the claim limitation of “a liquid crystal panel having a viewing area with a periphery;” as a string of unrelated items. When he sees “liquid crystal panel,” he apparently understands this to mean any type of display; he finds item 13 in Eichen -- a plotter and cites it as teaching a display -- REMEMBER THE CLAIM LANGUAGE IS TO A LIQUID CRYSTAL PANEL. A plotter is a specialized printer. In the art of touch screens for liquid crystal displays, a plotter (a specialized

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printer) cannot be argued to be a display device. Apparently then the Examiner see the words “viewing area” and finds in the Eichen reference the tablet 21. The Examiner fails to understand the claim is not “a display AND a viewing area”; the claim is “a liquid crystal panel HAVING a viewing area.” The viewing area IS NOT separable from the liquid crystal panel. Moreover, arguing that the tablet 21 is a viewing area is truly bizarre.

This string of mischaracterizations of the Eichen reference is the same “error” as in earlier appeals; i.e., the Examiner finds a display, cites it -- then finds something with a periphery and cites it, with no connection between the two. Again, this is the exact same trick as was attempted and rebutted in PABR2, but now just using new prior art.

But this is not the end of the story. He even earlier tried the very same trick, albeit with a different limitation, and it was argued in PABR1, which also resulted in a re-opening of prosecution.

In all three appeals filed, we have argued that the Examiner appears not to understand the interconnection of the elements and the meaning of the term “SAID”. He appears to think it means “ANY”.

This is not the only problem. Neither the plotter 13 nor the tablet 21 in Eichen is a display device. Moreover, neither are liquid crystal panels with a viewing area as recited in claim 1.

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He declares that the microphones that pick up the sound of an electrical spark in Eichen are the same as shockwave detectors for detecting a shock wave IN THE LIQUID CRYSTAL PANEL. The Examiner cannot ignore the fact that the detectors detect a shockwave IN the liquid crystal panel.

Since there is no liquid crystal panel in Eichen, there can be no shockwave in the liquid crystal panel.

Most importantly, it is clear that the microphones are NOT picking up shockwaves IN the surface of the tablet 21 because it utilizes removable overlays which are the structure that is actually touched by the pen when the spark is generated. (Note Eichen says the overlay could be made of cardboard.) It appears that when interpreting the teaching of Eichen, the plain ordinary meaning of the terms “sound” and “microphone” is meant, and they refer to detection of sound traveling through the air to the microphone. This, too, teaches away from the notion of detecting shockwaves IN a liquid crystal panel.

The Examiner concludes the rejection of claim 1 with the following statement:

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Eichen fails to teach a liquid crystal panel.

Duwaer teaches a digitizing tablet 12 and a touch screen 10, both have been integrated on a liquid crystal panel 14, col. 8, lines 29-44.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the liquid crystal panel as taught by Duwaer in the tablet of Eichen to integrally become the touch screen LCD display panel. The motivation for doing so would

The problem with this logic is that the Eichen reference does NOT teach detecting shockwaves traveling through the surface of any type of panel, and Duwaer specifically recites several ways to make a touch screen, each of which is a direct teaching away from the present invention. In other words, the teaching of the cited reference does not add up to the claimed invention, nor is there any evidence of record that would teach that the, albeit insufficient, teaching of these references be combined. Indeed, Duwaer specifically teaches how to make a touch screen and a tablet and gives several examples of each. But these examples do not include the teaching of tapping a spot and creating a shockwave IN any type of panel, especially a liquid crystal panel.

**Claims 11-16**

With respect to independent claim 11, per the discussion above, there is no teaching in Eichen of a display device, a liquid crystal material or a viewing area of the display panel. Since there is no display panel, there can be no tapping on the viewing area of that panel to generate a shockwave. Since there is no shockwave generated by

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the tapping on the viewing area, there can be no detection of that very same shockwave.

The pressing of the tip 221 of the pen 22 causes a switch 222 to create a spark which inherently makes a noise propagating through the air. There is no need to “TAP” the pen to create a disturbance; a simple and smooth soft touch of the tip can trigger the switch to create the sound; i.e., there is NO NEED to tap, and there is no need of tapping. A review of online dictionaries clearly shows that “tapping” includes the notion of a light striking blow of sufficient force to make a sound.

Since the claims require the step of “tapping a first location on said viewing area and thereby generating a shockwave as a result of such tapping,” there can be no prima facie case of obviousness because there is NO teaching in the cited reference that suggests the need to strike the surface of the liquid crystal with such a force as to create a shockwave in the liquid crystal. Indeed, the teaching of Eichen is away from “tapping” because Eichen teaches that the way to create a significant disturbance at the point of contact to be detected is to electrically switch on a spark to create a noise. This is a teaching away from “tapping.” Again, the spark of Eichen can be initiated by a mere pressing of the tip 221 of the pen 22, and there is no advantage gained by tapping or lightly striking anything with enough force to create a shockwave. The following excerpt from Eichen makes it clear that it is NOT necessary to TAP or lightly strike the surface of anything.



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35     **There is provided a tablet 21 particularly cooperat-**  
          **ing with a "pen" 22. As a tip 221 of the pen is particu-**  
          **larly brought into proximity to any point on tablet 21, a**  
          **spark is produced resulting in emanation of a sound**  
40     **wave of steep and recognizable, shock wave like**  
          **characteristics. In particular, upon touching the tablet**  
          **with pen tip 221, a switch 222 therein closes to enable**  
          **production of the spark.**

Again, it said the result of the spark is SOUND, and it has a recognizable shockwave-LIKE characteristic; i.e., it is not a shockwave; it is a sound wave with a shockwave-LIKE characteristic.

As above, when there is no teaching of tapping to create a shockwave, there can be no teaching of detecting the time of arrival of the NON EXISTENT SHOCKWAVE.

The Duwaer reference also is not cited for teaching these shortcomings or mischaracterizations of Eichen. Consequently, Eichen and Duwaer cannot create a prima facie case of obviousness with respect to claim 11.

**CLAIM 17**

Claim 17 includes limitations very similar to claims 1 and 11, and the arguments for Claims 1 and 11 are equally applicable to claim 17 with its liquid crystal material with a viewing surface, a plurality of shockwave detectors disposed around said viewing surface. Moreover, there is no TAP-GENERATED SHOCKWAVE taught or suggested by Eichen.

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**2. Whether claims 6-10 have been properly rejected under 35 U.S.C. §103 (a) as being unpatentable over Eichen et al. in view of Duwaer, further in view of Umemoto.**

Claims 6-10 are improperly rejected for the same reasons that claim 1 is improperly rejected. Claims 6-10 include additional limitations and Umemoto is cited to address these claim limitations. However Umemoto is not even cited to overcome the shortcomings of Eichen and Duwaer with respect to the rejection of claim 1.

**3. Whether claims 18-20 have been properly rejected under 35 U.S.C. §103 (a) as being unpatentable over Eichen et al. in view of Duwaer, further in view of Wilson.**

Claims 18-20 are improperly rejected for the same reasons that claim 17 is improperly rejected. Claims 18- 20 include additional limitations, and Wilson is cited to address these claim limitations. However, Wilson is not even cited to overcome the shortcomings of Eichen and Duwaer with respect to rejection of claim 17.

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**CONCLUSION**

The Applicants respectfully request the panel to actually allow this case. Sending the case back for a fourth time is not only wasteful of the Applicants' time, but the office's time as well.

The Applicant believes that the application as amended should be allowed.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gregory G. Williams", with a stylized flourish at the end.

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**CLAIMS APPENDIX**

Claim 1. A touch screen display apparatus comprising:

a liquid crystal panel having a viewing area with a periphery;

a plurality of shockwave detectors, disposed about said periphery; and

said plurality of shockwave detectors configured to use a time of arrival of a tap-generated shockwave to determine a point of origin of the tap-generated\_shockwave in the liquid crystal panel which results from a touch occurring at said point of origin.

Claim 2. A display of claim 1 wherein said periphery is free from a plurality of pairs of opposing transmitters and receivers disposed about said periphery where said plurality of pairs of opposing transmitters and receivers are configured to detect a presence of an object disposed on the viewing area and between said transmitters and said receivers.

Claim 3. A display of claim 2 wherein said viewing area is free from an electrically conductive transparent layer and free from a connection to an electronic detection means which is configured to detect touching.

Claim 4. A display of claim 1 further comprising:

a first array of shockwave detectors, disposed along a horizontal edge, which define a plurality of columns across said viewing area; and,

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a second array of shockwave detectors, disposed along a vertical edge, which defines a plurality of rows across said viewing area.

Claim 5. A display of claim 4 further comprising a third array of shockwave detectors opposite said first array of shockwave detectors and a fourth array of shockwave detectors opposite the second array of shockwave detectors.

Claim 6. A display of claim 4 wherein said liquid crystal panel is a multi-domain vertically aligned liquid crystal cell.

Claim 7. A display of claim 6 further comprising:  
  
means for determining a location of a tactile interaction on said viewing area by analyzing a time of arrival difference of a shockwave, due to said tactile interaction, on at least two non-co-located points.

Claim 8. A display of claim 7 further comprising an active thin film transistor layer in said liquid crystal panel; and,

wherein said first array of shockwave detectors is integrated into said thin film transistor layer.

Claim 9. A display of claim 8 wherein said first array of shockwave detectors is configured to detect a change of capacitance of said liquid crystal material in response to presence of a shockwave.

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Claim 10. A display of claim 8 wherein said first array of shockwave detectors is configured to detect a change of resistance of said liquid crystal material in response to presence of a shockwave.

Claim 11. A method of detecting a touch on a viewing panel of a liquid crystal display, comprising the steps of:

providing a display panel comprising a liquid crystal material, said display having a viewing area;

tapping a first location on said viewing area and thereby generating a shockwave as a result of such tapping;

providing a plurality of shockwave detectors which are not located at a single location;

detecting an arrival of said shockwave at each of said plurality of shockwave detectors;

determining a time of arrival of said shockwave at each of said plurality of shockwave detectors; and,

locating said first location in response to said step of determining a time of arrival of said shockwave.

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Claim 12. A method of claim 11 wherein said relative time of arrival is based upon a plurality of times of arrival of said shockwave at a plurality of shockwave detectors.

Claim 13. A method of claim 12 wherein said step of detecting an arrival of said shockwave comprises the steps of detecting a change in a predetermined electrical characteristic of said liquid crystal material in response to a presence of said shockwave.

Claim 14. A method of claim 12 wherein said step of detecting an arrival of said shockwave comprises the steps of detecting a change in a predetermined optical characteristic of said liquid crystal material in response to a presence of said shockwave.

Claim 15. A method of claim 11 wherein said step of locating said first location comprises using a triangulation computation.

Claim 16. A method of claim 11 wherein said step of locating said first location comprises a determination of a row and a column.

Claim 17. An apparatus for detecting a tactile stimuli upon a viewing area of a liquid crystal display comprising:

a liquid crystal material having a viewing surface;

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a plurality of shockwave detectors disposed about a periphery of said viewing surface; and

means for performing a triangulation computation to determine a location of a point of tactile stimulation on said viewing surface, said means for performing being responsive to signals representative of a detection of a tap-generated shockwave, generated at said point of tactile stimulation, by said plurality of detectors.

Claim 18. An apparatus of claim 17 wherein said plurality of shockwave detectors comprises a plurality of optical sensors disposed on a layer having thin film transistors thereon, where said plurality of optical sensors measures an optical characteristic of a segment of said liquid crystal material.

Claim 19. An apparatus of claim 18 wherein said optical characteristic is a brightness of light reflection of a surface on an opposite side of said liquid crystal material from said layer.

Claim 20. An apparatus of claim 19 wherein said means for performing a triangulation computation determines a relative time of arrival of a shockwave at said plurality of shockwave detectors.



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**EVIDENCE APPENDIX**

None

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**RELATED PROCEEDINGS APPENDIX**

None.